REVIEW PAPER

REVIEWING WEB SEARCHING IN THE 21ST CENTURY EDUCATION

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ABSTRACT

In this paper, the government's initiatives and policies for improving schools in the UK are highlighted to be the main drive for the Internet use of teachers and online resources in their classroom teaching. The aim of this review is to outline Web searching as an important part of education and society in the 21st century. Hence, in order to learn more about the Web searching needs and preferences of teachers and in particular those in the UK, researchers are recommended to explore future research questions in the area of teachers' information needs and search behaviours. This should enable researchers to better understand the barriers associated with the integration of ICT tools like the Internet in classroom teaching as well as the technological needs of teachers in the 21st century.

Keywords: Classroom Teaching, ICT, Internet, Teachers, Web Searching, World Wide Web.

INTRODUCTION

In 1998, just one year after New Labour came into power the Green paper titled "Teachers: meeting the challenge of change" was launched. This Green Paper was described by Tony Blair as (DfEE 1998, page 4),

> *"[...] the most fundamental reform of the teaching profession since state education began."*

For Tony Blair educational policy had high national priority, since education was believed to be the pivotal point of the economy and public services (Furlong, McNamara et al. 2008). Thus, the educational reform (his 'national campaign') was designed to strengthening the country's economy and public services. This view was highlighted in Furlong (2008, Page 728):

> *"National prosperity, social justice and cohesion are all seen to rest on the shoulders of education, on the creation of a highly skilled workforce with the knowledge, enterprise and insights required to attract the global supply of high-skilled, high-waged employment."*

The government intended to tackle problems with the teaching profession by injecting more and better trained teachers into the system and above all making teachers accountable for their teaching by detailing what should be taught in classrooms on a day to day practice. Individual teachers and the objective of schools were defined by the government's policy on education and its educational reform. According to Furlong 2009 (page 771), this change:

> *"[...] meant a profession that was more diverse in intake, was better paid held in higher esteem, better supported but, most significantly, a profession that was much more tightly managed in relation to national policy objectives than ever before." (Furlong 2009, page 771)*

Hence, the government's educational policies was focused on improving primary and secondary schools' literacy and numeracy achievements through Key Stages (KS) 4 and 3 strategies, respectively (DfEE 1997b; Blunkett 2000). Next, the "Every child matters" agenda came to the force (DfES 2003a) and lastly, the government's educational policy was shifted towards "Personalisation of Learning", (DfES 2006).

Indeed, it can be said that educational policies set by the government has made direct influences on the classroom practices of teachers, which often led to having extra work load. This fact was highlighted by (Katrijn, Kelchtermans et al. 2006, page 209) in the following statement:

> *"Although [decisions made by policy-makers] mostly justified by intentions of improving educational quality, teachers often experience such measures as a*

significant extension of their teaching role. Unfortunately, these extensions are, more often than not, distractions from the core activity of teaching."

As a second example, Nixon and his colleagues (2008) investigated the conditions, attitudes and implementation of National Policy teachers in English Further Education (FE) by reviewing reports and studies of UK educational policy at post-compulsory level during 1976 to 2007. In this review, studies that completed in the last ten years were selected for an in-depth analysis using qualitative research methods that is conducting semi-structured interviews with reflective diaries, group working and observations among teachers and managers and managers (Nixon, Gregson et al. 2008).

Results from this study confirmed that teachers have indeed executed government's national policy in their classroom and that teachers were able to manage this task by balancing their teaching responsibilities towards their students (learners) as well as their duties placed on them by the government with reservations about its practicality and concern for students' learning in general. Moreover, teachers motivation for embracing national policy was mainly to secure learners academic achievements and or schools benefits (Nixon, Gregson et al. 2008, pages 9-14).

Similarly, findings from Moore, Edwards et al. (2002) and Day et al. (2007) studies showed that teachers did indeed adapt to the government's new national policy despite being faced with substantial professional challenges and personal reservations. In the Teacher Identities Project, Moore, Edwards et al. (2002) investigated 80 teachers at nine schools with pupils age ranged between 5 to18 years olds. Findings from this study showed that teachers had described themselves as being both pragmatic and eclectic when adopting new national policies into their practice. And as, Moore, Edwards et al. (2002, page 552) described:

"[…] almost all of our respondents talked of the ways in which they had modified previous practice to 'bring it in line with' current policy, or had found ways of incorporating current policy into a largely unaltered continuing practice."

Moreover, according to Day and Gu (2007), teacher identity consists of three interrelated dimensions that is (1) professional dimension, which reflects on the social and national policy expectations of teachers regarding what content should be taught in the classrooms and how it should be delivered by teachers in particular; (2) situated dimension that related to schools and teachers local conditions for example, students' behaviour; and, (3) personal dimension, which was based on teachers' lives outside the school regarding their family and social roles. Hence, it was explained that in-balances in one or more of the dimensions (teacher identity) would cause tension on the wellbeing of teachers as well as their classroom management, commitment and resilience (Day and Gu 2007, page 431).

Consequently, teaching in the 21st century is rated as one of the most stressful professions (PWC 2001; Kyriacou 2003; Deakin, James et al. 2010). For example, in Kyriacou (2003) book entitled "Stress-Busting for Teachers", ten common sources of stress were reported by teachers. In this book, issues relating to time pressures and workload of teachers and their coping with change were also listed among the ten common sources of stress. The changes made to the working practices of teachers mainly through the government's educational policies on teaching methods and assessments were described by Kyriacou (2003, page 28):

"There is little doubt that the frequent changes which have occurred in curriculum content and teaching methods, coupled with the introduction of greater accountability and public assessment of teachers' performance, have generated a great deal of stress".

Additionally, in the Teachers' Workload Diary Survey 2010 of two thousand one hundred and seventy nine teachers (164 schools), it was reported that teachers would like to spend more time doing activities such as planning, spending more time with pupils and preparing resources. Interestingly, the activities that teachers were unable to do but considered as part of their role also included planning, delivering better lessons and preparing displays. What's more, activities that teachers liked to spend less time doing included planning, preparing displays and making/finding

resources (Deakin, James et al. 2010, page 27).

Consequently, findings from Deakin, James et al. (2010) and indeed Kyriacou (2003) does evidently highlight the professional challenges of teachers in meting government's new educational policy (personalisation of learning) and their need for preparing teaching materials (Deakin, James et al. 2010, page 27).

Aims of the review

The aim of this review is to outline Web searching as an important part of education and society in the 21st century. In this review the government's initiatives and its policies for improving schools in the UK are highlighted to be the main drive for the Internet use of teachers and online resources in their classroom teaching. Hence, in reality teachers are expected by the government to use the Internet and online resources in their classroom teaching.

Process of the review

In this review, issues relating to (1) the rise of the Internet and the World Wide Web and (2) Web searching are discussed in relation to the use of the Internet and online resources. Moreover, the UK government's initiations and its policies on Information Communication Technology (ICT) and Information Technology (IT) in the education sector are briefly outlined within the context of (3) Internet and education in the 21st century.

The rise of the Internet and the World Wide Web

The Internet emerged forty years ago, in 1969, through the development of the ARPANET, a computer network set up by the Advanced Research Projects Agency (ARPA). This agency was formed in 1958 by the Defence Department of the United States and the Internet was developed in one of ARPA's departments called the 'Information Processing Techniques Office', which was established in 1962.

The 'Web' emerged in March 1989, twenty years after the creation of the Internet, by a team led by Tim Berners-Lee who developed software called the 'World Wide Web'. The key feature of this software was the invention of the Universal Resource Identifier called HTTP address or what is currently referred to as the Universal Resource Locator (URL), designed to locate objects on the Internet using their unique addresses (Kogut 2003, page 20).

The first website placed on the Internet was 'http://info.cern.ch/' and contained information about the World Wide Web project, its features, capabilities, explanations on how to search the Web for information together with advice on how people could design and upload their website using the system. This invention enabled Web users (mainly academics and researchers at that time) to create and publish their work on the Internet as well as being able to share comments and suggestions about each other's publications (CERN 2006).

In late 1994 to early 1995, the World Wide Web was further enhanced by the development and distribution of a Web browser called 'Netscape Navigator' (originally named 'Mosaic') to both educational and commercial users. This browser was programmed by Marc Andreessen and his colleagues for the purpose of storing and retrieving images.

Following the success of Netscape Navigator, other Web browsers were developed. For example, Microsoft launched its very own browser called the 'Internet Explorer' as part of its Windows 95 software. In the same year, Sun Microsystems developed the 'Java' programming language for computers to download and run application programs or "applets" from the Internet. This software was made freely available to online users and indeed via the Netscape Navigator (Castells 2001, page 16).

The success of the World Wide Web as explained by Berners-Lee (2007) is due to its flexibility and openness to all systems and users around the world, which is mostly based on the following three main factors:

> *"[…] 1) unlimited links from any part of the Web to any other; 2) open technical standards as the basis for continued growth of innovation applications, and; 3) separation of network layers, enabling independent innovation for network transport, routing and information applications."* (Berners-Lee 2007, page 2).

In addition, in Kogut (2003) article about the 'Global Internet Economy', integration of the World Wide Web software together with the creation of Web browsers such as the 'Netscape' were highlighted as the two main influential factors in the rapid growth of the Internet. Furthermore, the 'semantic' Web of the future was predicted by Berners-Lee

(2007) as one that will serve its users much better; will allow Internet users to view websites from a number of different entry points and will ultimately become part of our surroundings:

> *"First the Web will get better and better at helping us to manage, integrate and analyze data […] Second the Web will [be] accessible from [a] growing diversity of networks (wireless, wireline, satellite, etc.) and will be available on a ever increasing number of different types of devices. Finally, in a related trend, Web applications will become a more and more ubiquitous throughout our human environment, with walls, automobile dashboards, refrigerator doors all serving as displays giving us a window onto the Web."* (Berners-Lee 2007, page 5)

Meanwhile, technology advancements in the Internet and World Wide Web have enabled individuals to talk to each other via video conferencing or teleconferencing tools; to watch news and television programs online; to listen to radios and music; to receive/send mails; to buy goods/services; to book holidays; to register for educational or training courses; to meet new people and make new friends; ask questions from experts via chat rooms, forums or other social groups like the 'Facebook' and 'MySpace'; as well as enabling people to work away from the office environment; meet deadlines by submitting reports or assignments via the Internet and so forth (Slevin 2000, page 38-46; Alexander 2006, n.p). In fact, in the ONS (2011, page 5) Internet access survey, it was reported that:

> *"[…] 19 million households in Great Britain had an Internet connection. This represented 77 per cent of households, up from 73 per cent in 2010."*

The ONS (2011, page 3) also reported a growth in the use of wireless (wi-fi) hotspots across Great Britain, as described below:

> *"In 2011, 4.9 million people, or 13 per cent of Internet users, connected to wireless hotspots provided at restaurants, cafes, hotels, airports etc. The wide availability of these hotspots has encouraged large growth in use over recent years with a seven fold increase since the 2007 estimate of 0.7 million people."*

Equally, social networking was identified as the most popular activity especially among the 16 to 24 year olds (ninety one per cent). In general, social networking was more popular among the women Internet users at sixty per cent (ONS 2011, page 3).

Other examples (from non-academic sources) of users search patterns include the eMarketer report (market researcher and trend analysis on Internet) on the 'UK Internet users and usage'. In this report it was estimated that almost thirty seven million people went online in an average month that is over sixty per cent of the population (Abrams 2008, n.p). Hence, it was predicted that by the year 2012, Internet use in the UK will reach about seventy per cent of the population:

> *"Britain has one of the most experienced and active online populations in the world." (Abrams 2008, n.p).*

Technologists like Reisinger (2007, n.p), have also argued that the Internet is becoming one of the most essential components of human survival in the 21st century:

> *"The truth of the matter is that we, as a world, have become so reliant on the Internet that it's quickly becoming just as important as water."*

Moreover, with the invention of Web 2.0 and government's call for an increased use of online resources and online based tools in classroom teaching, teachers are frequently incorporating digital resources into their lesson plans and have began using collaborative tools such as 'wikis', 'blogs' and social networks. A clear distinction between Web 1.0 and Web 2.0 was made by Brown (2008, n.p) when he stated that:

> *"The original World Wide Web—the "Web 1.0" that emerged in the mid-1990s—vastly expanded access to information. […] But the Web 2.0 […] Tools such as blogs, wikis, social networks, tagging systems, mashups, and content-sharing sites are examples of a new user-centric information infrastructure that emphasizes participation (e.g., creating, re-mixing) over presentation, that encourages focused conversation and short briefs (often written in a less technical, public vernacular) rather than traditional publication, and that facilitates innovative explorations, experimentations, and purposeful*

tinkerings that often form the basis of a situated understanding emerging from action, not passivity."

The main reasons for embracing Web 2.0 in education and indeed classrooms were summarised by Becta (2008) as being (i) pupils' familiarity with Web 2.0 applications; (ii) the UK government's educational policy that was aimed at refining collaborative learning in schools and engaging the less enthusiastic student (DfES, 2005); and (iii) the relevancy of Web 2.0 to theories of learning, as described below:

"The most straightforward reason must be recognition that young people are already engaged by Web 2.0 applications. […] that that there is a match with current overarching policy and curriculum goals […] that the forms of activity cultivated within Web 2.0 are widely endorsed as important by theoretical perspectives on learning." (Becta 2008, page 28-29)

Teachers are using 'wiki' websites (websites that uses wiki software for users to freely create and edit its Web contents) to initiate project ideas, run brainstorming sessions and teach languages and creative writing. For example, teachers and students are required to learn together since "[…] knowledge is no longer transmitted from one to the other, but each person shares a part of what they know to construct a whole." (Cych 2006, page 35) Blogs on the other hand are used by individual teachers (another teaching tool) to further engage students in their learning by having online discussions about a particular topic. Additionally, Podcasting technology (broadcasting audio files over the Web) are used by teachers to upload their lectures and course notes online for their students and alert the interested individuals to then using 'RSS' technology, formally known as the 'Really Simple Syndication'. This is said to be a mechanism used for disseminating news and information, and for retrieving personalised content (Cych 2006, page 36).

The Internet is also used by teachers to better prepare and manage their teaching responsibilities and daily tasks. According to the Harnessing Technology Review, ICT usage among teachers at schools and further education colleges in the UK has shown a continues growth (Becta 2007):

"Schools are beginning to provide remote access to their networks from for staff and pupils. In secondary schools and FE colleges, learning platforms give practitioners and learners access to growing repositories of digital resources, increasing the range and quality of materials available [also] […] Some use of technology to support personalised learning is evident, this is at an early stage."(Becta 2007, page 10)

Nevertheless, despite advancement in Internet technology and development people including teachers are still reported to be using popular search engines like Google for finding relevant online resources:

"Most of the nearly half a billion users of online social networks [i.e. Facebook and MySpace] continue to use Web 1.0 sites." (Cormode and Krishnamurthy 2008, page 2)

Therefore, this is why the development of search engines is a key element of Internet use in Web 2.0 and beyond. Indeed the advancement of Web technology and the idea that education needs to be personalised according to the learning needs and preferences of individual students highlights the need for research to be undertaken on the potential value of personalised Web searches.

With this background information in mind, the following section of this review will further outline the importance of the World Wide Web together with Web searching in the 21st century.

Web searching – a key element of Internet use

Twenty years ago, when the World Wide Web opened to the public, the Internet contained only one website for users to visit (Bryant, 2012). Nowadays, it is estimated that currently we have 612,843,429 websites on the Internet (Netcraft 2012, n.p). The importance of the Internet and its access to information was also highlighted in the Pew Internet (2010) online survey of eight hundred and ninety five technology stakeholders and critics. As Anderson and Rainie (2010, page 2) reported that:

"[…] 76% of these experts agreed with the statement, By 2020, people's use of the Internet has enhanced human intelligence; as people are allowed unprecedented access to more information they become smarter and make better choices. Nicholas

Carr was wrong: Google does not make us stupid."

Moreover, in a recent Oxford Internet Survey (Dutton and Blank 2011, page 22), the Internet was reported to be the first port of call when people look for information:

> *"In 2011, they [people] used the Internet first especially when looking for information on issues for a professional, school or personal project (66%), planning a trip (58%), seeking information about local schools (54%) or about a company (39%)"*

Today, Web users can easily add new websites or Web pages to the Internet; create and store their personal images and information online through the availability of various Web tools using hosting packages or free Web spaces online. For example, when joining websites such as 'myspace', 'blogger.com' or 'facebook', Internet users with little or no programming skills are able to write and publish their Web pages easily. In fact, this development was previously highlighted in Strauss (2007) article entitled "The Future of the Web, Intelligent Devices and Education". In this article Strauss (2007, page 34) described the Web as an indispensable tool that was used in nearly all aspects of life:

> *"In the past the Web was used to display documents and images. Today it is being used for education, research, software distribution, audio and video conferencing, and electronic commerce."*

Tim Berners-Lee (2007) also explained that the Web has improved enormously during the last five years with the invention of new technologies like broadband and the wireless technology. Accordingly, the Web continued to improve as in ONS (2011, page 5) it was reported that:

> *"In 2011, 19 million households in Great Britain had an Internet connection. This represented 77 per cent of households, up from 73 per cent in 2010 […] Broadband has now almost entirely replaced dial-up Internet, with 93 per cent of Internet connected households using broadband compared with 84 per cent in 2007. Just 2 per cent of connected households used dial-up, compared with 16 per cent in 2007. The remainder used only a mobile Internet connection"*

Finally, the ease of finding online resources together with the increasing production of online contents (Web pages) was also observed in the Oxford Internet Survey (Dutton and Blank, 2011, page 21):

> *"Ease of finding information is one of the major reasons to go online, and people tend to turn to the Internet first when they are looking for information […] Creative activities and production of content are generally increasing. This is one effect of the considerable simplification of production made possible by social media."*

Therefore, with the Web ever expanding pages and digital contents, Web searching is indeed considered as a key element of Internet use in the 21st century.

Further to the above mentioned information, the following section of this paper will provide a brief literature review on the initiations and policies of the UK government in Information Communication Technology (ICT) and Information Technology (IT), in order to highlight the government's expectations on the Internet and ultimately online resources usage of teachers in their classroom teaching.

Internet and Education in the 21st century

Since the beginning of the 1990s, the UK government has set about incorporating Web technologies/services into the compulsory and post-compulsory education systems in order to accommodate students' educational learning needs and preferences in the 21st century. As the then Secretary of State for Education argued the following in 2005:

> *"I am particularly excited by the idea of giving every student and learner a personal online learning space where they can store their own course materials and assignments in digital form, and record their achievements […] I am also excited by the possibilities of new digital technologies to help us develop more tailored and personalised children's services." Ruth Kelly (DfES 2005b, pages 2-3)*

The Internet is also known to have 'revolutionised' the way in which knowledge is transferred between teachers and learners.

> *"We're moving away from the idea of organising knowledge through trees […] We are pulling the leaves*

off the tree and making a huge pile online consisting of every type of resource, idea, artwork and creativity there is, and adding every piece of metadata that we can and linking them all up." Weinberger, cited in (Allen 2006, page 29)

Accordingly, in this section, the initiations and educational policies of the UK government in Information Communication Technology (ICT) and Information Technology (IT) are briefly reviewed in order to provide the background information about the teaching practices of teachers working in the United Kingdom and in their daily classroom teaching. This brief review includes an introduction to the 'Department of Education and Skills (DfES) policy', 'Educational Department's Superhighways Initiative (EDSI)', 'National Grid for Learning (NGfL) policy' and the 'ICT in Schools Policy'.

Department of Education and Skills (DfES) policy

On 15th March 2005, the Department of Education and Skills (DfES) published the current e-Strategy entitled 'Harnessing Technology; Transforming Learning and children's services'. This document was aimed at personalising the educational system in the UK at four sectors; (i) Schools, (ii) Post-16, (iii) Higher Education and (4) Children's Services, for the next fifteen years through the use of digital and interactive technologies. This objective was then translated into the following four actions:

"Transform teaching, learning and help to improve outcomes for children and young people, through shared ideas, more exciting lessons and online help for professionals; Engage 'hard to reach' learners, with special needs support, more motivating ways of learning, and more choice about how and where to learn; Build an open accessible system, with more information and services online for parents and carers, children, young people, adult learners and employers; and more cross-organisation collaboration to improve personalised support and choice; Achieve greater efficiency and effectiveness, with online research, access to shared ideas and lessons plans, improved systems and processes in children's services, shared procurement and easier dministration." (DfES 2005a, page 2)

The objective also included the following six priorities

"An integrated online information services for all citizens. Integrated online learning and personal support for children and learners. A collaborative approach to personalised learning activities. A good quality ICT training and support package for practitioners. A leadership and development package for organisational capability in ICT. A common digital infrastructure to support transformation and reform." (DfES 2005a, page 5)

Moreover, under the e-strategy the vision of the government is that schools would be able to provide further support to pupils and all other educational stakeholders with the availability of the Internet across the educational spectrum. For example, under priority number one, schools are required to "Provide information portals for citizens, parents, carers, employers, and learners."; for Post-16's it is required to "Develop a workforce Web portal for information, advice and guidance on e-learning."; and for the children's services the government is set to provide information for children and young people through the "need2know" website at "www.need2know.co.uk" and the parent's central website at "www.ukparents.co.uk" (DfES 2005).

Indeed, the Harnessing Technology strategy holds upon a series of preceding policy drives to support the Internet use of teachers that includes the 'ICT in Schools Policy', 'National Grid for Learning' (NGfL) and 'Educational Department's Superhighways Initiative' (EDSI).

ICT in Schools Policy (2001-2005)

On 21st May 2003, new ICT policies for schools was launched by the Education Secretary, Charles Clarke in the document entitled "Fulfilling the Potential – Transforming teaching and learning through ICT in schools". In this three year programme (2003-2006), schools' next developmental plans after the National Grid for Learning (NGfL) programmes regarding ICT (Information and Communication Technology) and e-Learning were outlined. Schools plans were further highlighted by Teachernet (2003):

"To build on the considerable achievements of the NGfL and ICT must become an integral and natural

part of the learning process. The next stage is to ensure that for all schools ICT makes a significant contribution to teaching and learning across all subjects and ages and inside and outside the curriculum."

In addition, the 'Curriculum online' was launched in January 2003 to further improve standards of schools in the UK by encouraging the use of digital resources among teachers in their classrooms. The main objectives of this website were outlined by Curriculum Online (2005, n.p):

"The main objectives of Curriculum Online are to help teachers to find digital learning resources for use in the classroom, and to promote the supply of new and innovative resources for schools."

In this project, a total of one hundred million pounds worth of eLearning Credits (eLCs) was funded by the government to schools for the purchase of their online resources. This funding was allocated to schools between the years 2003 and 2006 (Kitchen, Dixon et al. 2006, page 7).

Finally, developments in online resources include the introduction of 'National Digital Resource Bank' (NDRB), Harnessing Technology strategy in the UK. This repository is aimed at providing teachers with quality assured and copyright safe online resources:

"The NDRB is essentially a gigantic online swapshop. If it works, teachers will hit "Search" and gain access to resources designed and tested by their 400,000 colleagues across the country. Hours spent concocting lesson plans late into the night will be a thing of the past. Students will also be able to download educational videos, exercises and audio clips. And, unlike what Google throws up, everything will be quality assured and copyright safe." (Davis 2009, page 1)

The interface designed for the NDRB was described by Fiona Iglesias, project manager (Davis 2009, page 1), as being simple and easy to use:

"[…] teachers will barely need any training to use the new resource. A simple Google-like interface will allow teachers to search for whatever they want. They can refine their search by key stage and subject, as well as selecting whether they want a full lesson plan, or a video, activity or resource to slot into an existing agenda. A star rating like that used by eBay will allow teachers to rank resources they have tried and approved, encouraging."

However, on the 30th September 2011, the NDRB Website was closed down. The project termination was due to lack of funding for its hosting costs. This decision was further explained by Sirius (2011, n.p), the technical support:

"At the moment we are not aware of any sponsors able to help cover the hosting costs at Janet, and so it is with deep regret that we will need to shut down the NDRB service at this time. Our current plan is to decommission the hosting servers and archive the content onto a set of DVDs with the hope that someone else will be able to benefit from the collection created to date."

National Grid for Learning (NGfL)

The National Grid for Learning (NGfL) policy was a four year programme (1998-2002). This policy was initiated by the UK government in October 1997 in order to improve school standards especially with regards to their 'literacy' and 'numeracy' curriculum, so that "[…] learners in the various home countries of the UK can access information most directly relevant to their local education systems." (Bates 1998, n.p). The creation of the NGfL policy was closely related to the United State's idea of a 'Community Learning Utility' (Baker 1997). Hence, the NGfL was defined as:

"- A way of finding and using on-line learning and teaching materials. - A mosaic of inter-connecting networks and education services based on the Internet which will support teaching, learning, training and administration in schools, colleges, universities, libraries, the workplace and homes." (DfEE 1997a, page 3)

The NGfL policy targets were to achieve the following outcomes

"by 1999 all Newly Qualified Teachers would need to become ICT-literate to mandatory standards to receive the award of Qualified Teacher Status;

by 2002 serving teachers should generally feel confident, and be competent to teach, using ICT

within the curriculum;

by 2002 all schools, colleges, universities and libraries and as many community centres as possible should be connected to the Grid, enabling perhaps 75% of teachers and 50% of pupils and students to use their own e-mail addresses by then;

by 2002 most school leavers should have a good understanding of ICT;

by 2002 the UK should be a centre for excellence in the development of networked software content for education and lifelong learning […] and a world leader in the export of learning services; and

from 2002 general administrative communications to schools and further higher education bodies by the UK Education Departments, Ofsted and non-departmental public bodies, and the collection of data from schools, should largely cease to be paper-based." (DfEE 1997a, page 24)

The NGfL policy was implemented throughout the UK (England, Northern Ireland, Scotland and Wales). For example, in England, under the ICT (information and communications technology) training programme more than four hundred and eighty five thousand teachers and school librarians signed up for training (BigLotteryFund 2002, n.p). The NGfL policy was focused on teacher developments, the school sectors and indeed lifelong learning via three main strands (DfEE 1997a):

1) Infrastructure and service for networked learning – this was done through the development of the 'National Grid' website for learners to use. This programme was also closely linked to the government's plans for ICT training which was funded through the National Lottery.

2) Software and content development – the Grid intended to bring national and local museums, galleries, libraries and content developers to digitalize and distribute their resources online. NGfL's first prototype was launched on the 14th January 1998 and provided resources to all educational sectors that are school learners, further education, higher education, libraries and lifelong learners.

3) Teacher training programmes – this was achieved through the development of a 'Virtual Teacher Centre' (VTC) and a unique database. Under this training programme, teachers and librarians were educated via the Grid (website) about the appropriate and successful ways of using ICT in the classroom for delivery of their subjects and possibilities of differentiating education for children with special needs.

This programme was funded by 'The People's Lottery'. Moreover, in a White paper produced by the Labour government (outlining their new educational plans for the country) the New Opportunity Fund (NOF) was introduced as the 'sixth good cause' eligible for lottery funding covering areas of 'health', 'education' and the 'environment'. Initially more than three and half billion pounds of the lottery money was divided equally between Charities, the Arts, Sports, the Heritage and the Millennium in order to fund projects all over the country that was for the following purpose:

"[…] To use this new Fund initially to train teachers and librarians to help of all ages learn, using new technology to build up out of school activities for children; and to establish a network of healthy living centres across the nation." (Lloyd 1997, n.p)

Under the NGfL programmes, almost all schools were connected to the Internet with over a quarter using broadband connections. NGfL also provided continuous professional developments (CPD) and leadership programmes in ICT for teachers to participate with almost all schools (99%) having signed up for or completed training. Teacher confidence in the use of ICT in their classroom teaching (curriculum) was also improved and funding was provided to give computers to over one hundred thousand teachers. Furthermore, the online curriculum was launched for teachers to search and purchase online resources for their classroom teaching from both public and private suppliers. Together with, the establishment of over six thousands UK online centres (over two thousand Learndirect centres) aimed at providing access to ICT in the community (DfES 2003b, page 6).

However, despite success of the Grid, the NGfL website (gateway to education resources) and the NGfL Scotland are no longer active. This move was mainly due to advances in new Internet technologies and the active

involvements of schools in developing and sharing online teaching resources (Teachernet 2003).

> *"What has tended to happen is that local authorities or regional consortiums have developed high-speed links between their schools, which are still flourishing […] When the grid began, most local authorities did not have their own systems for collating or searching material - now they did."* cited by (Eason 2006, n.p)

Educational Department's Superhighways Initiative (EDSI)

The Educational Department's Superhighways Initiative was a project initiated by the Conservative government in 1995 to investigate possible ways in which communication technology could be used in education and indeed to support future educational needs. The EDSI constituted of 25 educational projects; 19 in England, 2 in Wales, 2 in Northern Ireland and 2 in Scotland, with a budget of more than twelve million pounds. The participants for these projects consisted of over four hundred and eighty institutions in primary schools, secondary schools, colleges and higher education, and more than one hundred and fifty thousand learners (EDSI 1999, page 2). The aims of the EDSI evaluations were:

> *"To assess the potential of intermediate and broadband technologies to enrich teaching and learning in a variety of contexts including school, college, at home or in the workplace;*
>
> *To identify those services and applications that provide the greatest benefit;*
>
> *To identify optimum conditions and strategies for the successful implementation of broadband networks, services and applications and to disseminate those lessons; and*
>
> *To recommend future directions for industry and the education service for the wider implementation of such networks as they become available and affordable." (EDSI 1999, pages 2-3)*

The 'Descriptions', 'Aims and outcomes', 'Sponsors' and 'Costs and cost benefits' of each project can be found in Becta's reports and publications, archives and websites (EDSI 1999).

Moreover, the findings obtained from these projects were used to develop more advanced educational systems called the National Grid for Learning (EDSI 1999, pages 2-3).

Therefore, it can be apparent from the government's ICT and IT initiations and its policies (discussed in their review) that the Internet is an important part in transforming education in the 21st century. Since, it is the government's expectation of teachers to use the Internet and online resources in their classroom teaching, given that teachers are the main (and perhaps the most important) end-users in the government's ICT policy agenda.

Teachers are the first group of users exposed to new teaching practices and technologies in education, which are often introduced through compulsory teacher trainings and new curriculum standards, This, therefore, makes teachers the pivotal point of all the government's educational policies and indeed the key implementers of their system seeing that teachers are the facilitators and mediators between students and the new educational technologies outlined by the government.

Discussion

In this review, it was discussed how the Internet is now considered to be an integral facet of contemporary life – easy to use and one of the ICT tool requirements of the individual user. Moreover, given the current status of the Internet and its impact on our society together with the government's educational policies and its initiations for incorporating online systems or activities (among users such as teachers, students and parents), the Internet is undoubtedly an important part and our society in the 21st century and indeed teaching profession.

Implications of the study

For teachers to fully embrace the government's ICT policies in their classroom teachings and indeed to ensure their continue use of ICTs such as the Internet especially online resources, there need to be a better understanding of the Internet usage of teachers in the 21st century education. Furthermore, to support teachers in the UK, in particular, we need to have technical supports when searching the Internet for online teaching resources. This level of support can only be achieved through a better understanding of the online searching needs, practices of teachers and their individual teaching preferences when incorporating online

resources in their classroom teaching.

Recommendation

The author's recommendation based on this review is that further research is required in the area of information needs and search behaviours of teachers. Researchers could develop new research questions investigating the Internet use of teachers in the classroom teaching, the online searching practices of teachers and their schools ICT training programmes in order to provide teachers with the much needed technical support, particularly for those in the UK. For example, future studies could be initiated by reviewing the barriers associated with the use of ICT tools by teachers in their classroom teaching (Seyedarabi 2012) and the efficiency of Web searching by teachers in the 21st century education (Seyedarabi 2011), respectively.

In addition, researchers may investigate the creation, re-use and access of educational contents online. Access to online resources includes studying the interface design of the educational and generic search engines together with their returned search results.

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